A GENERALIZATION OF YOUNG’S $\ell^p$ INEQUALITY

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Abstract. We show that, for positive real numbers with $a \geq 1 + \sum_{i=1}^{N} \alpha_i$, the function
\[
\frac{a^p}{\prod_{i=1}^{N} x_i^{\alpha_i}}
\]
has a convex conjugate of the same form and so, in particular, obtain a clean proof that $f$ is convex.

Key words and phrases: Fenchel conjugate, Young’s $\ell^p$-inequality, convexity.

REFERENCES